

REMARKS

Claims 20 to 22 are added, and therefore claims 8 to 14 and 16 to 22 are currently pending and being considered (since claim 15 was previously withdrawn in response to a restriction requirement).

Reconsideration of the application is respectfully requested based on the following remarks.

Claims 8, 11, 12, 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,160,309 (“Le”) in view of U.S. Patent Application Publication No. 2002/0011661 (“Terasaki et al.”).

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Also, as clearly indicated by the Supreme Court in *KSR*, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

Still further, the “problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem”, Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 679 (Fed. Cir. 1998).

In this regard, the problem addressed by the presently claimed subject matter is as follows:

Press-fit diodes have a press-fit base that is pressed into a matching recess of a fastening element (and that provides a stable thermal and electrical connection between the diode and the rectifier system), and has a mounting section on which a semiconductor chip may be affixed by soldering. A head wire is affixed to the semiconductor chip and to a phase-supply line of the vehicle generator. Since motor vehicle mechanical vibrations exert stress on the diode and its affixation, the diode is encapsulated to establish a keyed connection between the head wire and the press-fit base which is used to provide traction relief for the sensitive semiconductor chip and solder layers between the chip, the press-fit base and the head wire. A collar or sleeve joined to the press-fit base surrounds the semiconductor chip and the head and sections of the head wire, and the resulting space is filled with cast resin or epoxy to ensure stability. A collar at the base fixes together the semiconductor chip, diode head and head wire after encapsulation with the encapsulating material or cast resin. (See Substitute Specification, page 1, lines 5 to 30).

In particular, Figures 4, 5 and 6 show conventional press-fit diodes, which have no step at the wire shaft or head. As a result, any stability is derived from the encapsulating material in which the wire shaft is embedded. The disadvantage of the approach as compared to the presently claimed subject matter is that to ensure stability, the outer walls or the sleeves of the housing must be considerably longer than with the presently claimed subject matter. Therefore, the cavities to be filled with encapsulating material are also larger than that required by the presently claimed subject matter, and the entire wire head and a section of head wire 17 must thus also be surrounded by encapsulating material to be made stable. (See Substitute Specification, page 4, lines 1 to 8).

Thus, whereas the "conventional" diodes of Figures 4, 5 and 6 require between 0.369 and 0.630 g plastic material as encapsulating material and for the sleeve, the two exemplary embodiments according to the presently claimed subject matter require 0.318 g of which 0.232 g are encapsulating material (Figure 1), or 0.323 g of which 0.242 g are encapsulating material (Figure 2), or 0.316 g in a further optimization of the embodiment according to Figure 2. (See Substitute Specification, page 4, lines 15 to 19).

CLAIMS 8 and 11

Claim 8 is to a diode, including: a press-fit base including an axially extending mounting region to mount a semiconductor chip; a head wire provided with a head

configured to be affixed to the semiconductor chip; and a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities; in which the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. In this respect, Figures 1 and 2 display this region (21), and the Substitute Specification at page 3, lines 9 to 16, describes this feature. In this way, less epoxy may be used, and the fire risk may be reduced when the diode is overloaded, as explained in the Substitute Specification of the present application.

In contrast, the Le reference nowhere discloses, or even suggests, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as admitted at paragraph 5 on page 2 of the Final Office Action. Further, the protuberance 6c of the secondary Terasaki reference is not shown as, nor is it disclosed as, providing this function of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing. Indeed, all of Figures 1, 2, and 9 through 14 of the Terasaki reference indicate that the insulating member 7 is not enclosed within a housing, but is instead free to flow outside of the protuberance 6c, side wall 3a, and support electrode body 3.

As to the terse and conclusory assertions in the Advisory Action, these are wholly conclusory in nature. In fact neither reference even concerns the use of a diode which is designed for stability in a motor vehicle. Accordingly, there would be no motivation to combined the references so as to provide the presently claimed subject matter. Still further the wholly conclusory assertions by the Office do not in any way refute the benefits provided by the presently claimed subject matter, and that there is no motivation to combine the references as applied to provide such benefits, since they do not even refer to or operate in the context of the problem addressed by the presently claimed subject matter.

Accordingly, the proposed combination of the Le and Terasaki references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 8.

It is therefore respectfully submitted that claim 8 is allowable, as is dependent claim 11 (as well as claims 12 to 14).

CLAIM 12

Claim 12 further provides that only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material., as explained above.

It is therefore respectfully submitted that claim 12 is allowable for this further reason.

CLAIM 13

Claim 13 further provides that the head includes at least two regions having different diameters.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material., as explained above.

It is therefore respectfully submitted that claim 13 is allowable for this further reason.

CLAIM 14

Claim 14 further provides that the head is cone-shaped or bell-shaped.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material., as explained above.

It is therefore respectfully submitted that claim 14 is allowable for this further reason.

**B. The Rejections Under 35 U.S.C. § 103
That Claims 9 and 10 Are Obvious**

CLAIMS 9 and 10

Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Le in view of Terasaki, further in view of U.S. Patent No. 6,274,823 (“Khandros et al.”).

Claims 9 and 10 depend from independent claim 8, and are therefore allowable for essentially the same reasons as claim 8, as presented, since the third-level Khandros reference does not cure - and is not asserted to cure - the critical deficiencies of the Le and Terasaki references as to claim 8. Thus, the proposed combination of the Le, Terasaki, and Khandros references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 8, from which claims 9 and 10 depend.

Withdrawal of the rejections is therefore respectfully requested.

**C. The Rejections Under 35 U.S.C. § 103
That Claims 16 to 19 Are Obvious**

CLAIMS 16 and 17

Claims 16 to 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Le in view of Terasaki, further in view of Khandros et al.

Claim 16 is similar to claim 8 except that it includes the features of claims 9 and 11. As explained above, and as admitted at paragraph 32 on page 5 of the Final Office Action, the proposed combination of the Le and Terasaki references does not disclose, or even suggest, all of the features of claim 16.

Further, since the third-level Khandros reference does not cure - and is not asserted to cure - the critical deficiencies of the Le and Terasaki references as to claim 16, the proposed combination of the Le, Terasaki, and Khandros references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 16.

Accordingly, it is respectfully submitted that claim 16 is allowable for essentially the same reasons as claim 8 (and claims 9 and 11), as are its dependent claims - claim 17

(features correspond to claim 10) (as well as claim 18 (features correspond to claims 12 and 13), and claim 19 (features correspond to claim 14), as explained below).

CLAIM 18

Claim 18 further provides that the head includes at least two regions having different diameters, and that only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. It is also respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above.

It is therefore respectfully submitted that claim 18 is allowable for these further reasons.

CLAIM 19

Claim 19 further provides that the head is cone-shaped or bell-shaped.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above.

It is therefore respectfully submitted that claim 19 is allowable for this further reason.

Withdrawal of the rejections is therefore respectfully requested, since claims 8 to 14 and 16 to 19 are allowable.

As further regards each of the obviousness rejections, it is respectfully submitted that the cases of *In re Fine*, *supra*, and *In re Jones*, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), make plain that the Office's generalized assertions that it would have been obvious to modify or combine the references do not properly support a § 103 rejection. It is respectfully submitted that those cases make plain that the Office Action reflects a subjective "obvious to try" standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of *In re Fine* stated that:

The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. This it has not done. . . .

Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

In re Fine, 5 U.S.P.Q.2d at 1598 to 1600 (citations omitted; italics in original; emphasis added). Likewise, the Court in the case of *In re Jones* stated that:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].

In re Jones, 21 U.S.P.Q.2d at 1943, 1944 (citations omitted; italics in original).

That is exactly the case here since it is believed and respectfully submitted that the Office Actions to date offer no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding. Unsupported assertions are not evidence as to

why a person having ordinary skill in the art would be motivated to modify or combine references to provide the claimed subject matter of the claims to address the problems met thereby. Accordingly, the Office must provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter.

Also, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a “technologically simple concept” — which is not the case here — there still must be some finding as to the “specific understanding or principle within the knowledge of a skilled artisan” that would motivate a person having no knowledge of the claimed subject matter to “make the combination in the manner claimed,” stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper prima facie case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000) (emphasis added). Here again, there have been no such findings to establish that the features discussed above of the rejected claims are met by the reference relied upon. As referred to above, any review of the reference, whether taken alone or combined, makes plain that the reference simply does not describe the features discussed above of the rejected claims.

Thus, the proper evidence of obviousness must show why there is a suggestion as to the reference so as to provide the subject matter of the claimed subject matter and its benefits.

In short, there is no evidence that the reference relied upon, whether taken alone or otherwise, would provide the features of the claims discussed above. It is therefore respectfully submitted that the claims are allowable for these reasons.

As still further regards all of the obviousness rejections of the claims, it is respectfully submitted that not even a *prima facie* case has been made in the present case for obviousness, since the Office Actions to date never made any findings, such as, for example, regarding in any way whatsoever what a person having ordinary skill in the art would have been at the time the claimed subject matter of the present application was made. (See *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998) (the “factual predicates underlying” a *prima facie* “obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art”)). It is respectfully submitted that the proper test for showing obviousness is what the “combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art”, and that the Patent Office must provide particular findings in this regard — the evidence for which does not include “broad conclusory statements standing alone”. (See *In re Kotzab*, 55 U.S.P.Q. 2d 1313, 1317 (Fed. Cir. 2000) (citing *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1999) (obviousness rejections reversed where no findings were made “concerning the identification of the relevant art”, the “level of ordinary skill in the art” or “the nature of the problem to be solved”))). It is respectfully submitted that there has been no such showings by the Office Actions to date or by the Advisory Action.

In fact, the present lack of any of the required factual findings forces both Appellants and any Board to resort to unwarranted speculation to ascertain exactly what facts underly the present obviousness rejections. The law mandates that the allocation of the proof burdens requires that the Patent Office provide the factual basis for rejecting a patent application under 35 U.S.C. § 103. (See *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A. 1967))). In short, the Examiner bears the initial burden of presenting a proper *prima facie* unpatentability case — which has not been met in the present case. (See *In re Oetiker*, 977 F.2d 1443, 1445, 24, U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992)).

New claims 20 to 22 do not add any new matter and are supported by the present application, including the specification. Claim 20 includes features like those of claim 8 and 16 and is therefore allowable for essentially the same reasons, as are its dependent claims 21 and 22. Additionally, claim 20 further provides that the region is an outer surface region, and that the press-fit base with a mounting region, the sleeve and an outer surface region of

the stepped wire connection form a completely sealed housing, which is filled with the encapsulating material to protect the semiconductor chip. This sealed housing feature is nowhere disclosed nor suggested by the applied references, which make plain that there structure is an open one. In the context of the presently claimed subject matter, the sealed housing provides better protection. Accordingly, claim 20 is allowable for these further reasons, as are its dependent claims 21 and 22.

Additionally, claim 21 further provides that a total amount of plastic material for the encapsulating material and for the sleeve is no more than about 0.323 grams, of which no more than about 0.242 grams for the encapsulating material. This reduced amount of plastic is specifically recited to make plain the benefit of the present structure as compared to conventional arrangements, as discussed herein and in the present application. This feature is nowhere disclosed nor suggested by the applied references. Accordingly, claim 21 is allowable for these further reasons, as is its dependent claim 22.

Accordingly, pending and considered claims 8 to 14 and 16 to 22 are allowable for the foregoing reasons.

CONCLUSION

Applicants respectfully submit that all pending and considered claims 8 to 14 and 16 to 22 of the present application are allowable. It is therefore respectfully requested that the rejections (and any objections) be withdrawn. Prompt reconsideration and allowance of the present application are therefore respectfully requested.

Respectfully submitted,

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By: 

Gerard A. Messina
Reg. No. 35,952
KENYON & KENYON LLP
One Broadway
New York, New York 10004
(212) 425-7200

CUSTOMER NO. 26646